Stoller
Grand Junction Office established 1959

299-E13-17 (A5862)
Log Data Report

Borehole Information:

Borehole:	299-E13-17 (A5862)		Site:	South of 216-B-34 Trench	
Coordinates (WA St Plane)		GWL[1] (ft):	334.75	GWL Date:	06/25/03
North (m)	East (m)	Drill Date	Ground Level Elevation (ft)	Total Depth (ft)	Type
134215.994	573057.569	03/57	736.20	358.0	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded Steel	1.8	6 5/8	6 1/8	1/4	+1.8	100.0
Threaded Steel	0.3	8 5/8	8.0	5/16	+0.3	357.0

Borehole Notes:

The logging engineer measured the 6- and 8-in. outside casing diameters with a caliper. Inside diameters for the 6-in. casing and the caliper were measured using a steel tape; measurements were rounded to the nearest 1/16 in. Casing thickness was calculated. The inside diameter for the 8-in. casing was estimated. Casing stickup was measured using a steel tape. Groundwater level was measured by the logging engineer.

Ledgerwood (1993) reported the 6-in. casing was set to 100 ft on a packer in 1984. The 8-in. casing was perforated from 0 to 93 ft. Grout was placed in the annular space between the 6- and 8-in. casings and through the perforations into the formation. The 8-in. casing was also perforated between 308 and 356 ft, although no grout is reported as having been used in this interval. Casing depths and total depth of the borehole were derived from Ledgerwood (1993). Depth to the bottom of the borehole was reported at 336.2 ft in January 1992. Total logging depth was 334 ft.

Logging Equipment Information:

Logging System:	Gamma 2E		Type:	SGLS (70%) SN: 34TP40587A
Calibration Date:	03/03	Calibration Reference:	GJO-2003-430-TAC	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2	3 Repeat	4	
Date	06/24/03	06/25/03	06/26/03	06/26/03	
Logging Engineer	Spatz	Spatz	Spatz	Spatz	
Start Depth (ft)	100.0	334.0	171.0	137.0	
Finish Depth (ft)	2.0	138.0	138.0	99.0	
Count Time (sec)	200	100	100	100	
Live/Real	R	R	R	R	

Log Run	1	2	3 Repeat	4	
Shield (Y/N)	N	N	N	N	
MSA Interval (ft)	1.0	1.0	1.0	1.0	
ft/min	N/A[2]	N/A	N/A	N/A	
Pre-Verification	BE047CAB	BE048CAB	BE049CAB	BE049CAB	
Start File	BE047000	BE048000	BE049000	BE049034	
Finish File	BE047098	BE048196	BE049033	BE049072	
Post-Verification	BE047CAA	BE048CAA	BE049CAA	BE049CAA	
Depth Return Error (in.)	0	-1	N/A	0	
Comments	Fine-gain adjustment made after files -064 and -087.	Fine-gain adjustment made after files -108, -152, -175, and -182.	No fine-gain adjustment.	No fine-gain adjustment.	

Logging Operation Notes:

Spectral gamma logging was performed in this borehole from June 24 to 26, 2003. Logging was conducted with a centralizer on the sonde for log run 1 between 2 and 100 ft. Because this interval contained two casings and grout, a counting time of 200 seconds was used. Below 100 ft a centralizer was not used and counting time was 100 seconds. Logging data acquisition is referenced to the top of casing. No data were collected below groundwater. A repeat section was collected in this borehole to evaluate system performance.

Analysis Notes:

Analyst:	Henwood	Date:	07/23/03	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre-run and post-run verifications for the logging system were performed before and after each day's data acquisition. The acceptance criteria were met.

A combined casing correction for 0.5625-in.-thick casing was applied to the log data between 2 and 100 ft. Below 100 ft a correction for 0.3125-in. thick casing was applied.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with an EXCEL worksheet template identified as G2EMar03.xls using efficiency functions and corrections for casing, water, and dead time as determined from annual calibrations. Dead time corrections are applied where dead times exceed 10.5 percent; no dead times in excess of 10.5 percent were encountered. No correction for water was necessary.

Log Plot Notes:

Separate log plots are provided for the man-made radionuclide (^{137}Cs) detected in the borehole, naturally occurring radionuclides (^{40}K, ^{238}U, ^{232}Th [KUT]), a combination of man-made, KUT, and dead time, and total gamma plotted with dead time. For each radionuclide, the energy value of the spectral peak used for quantification is indicated. Unless otherwise noted, all radionuclides are plotted in picocuries per gram (pCi/g). The open circles indicate the minimum detectable level (MDL) for each radionuclide. Error bars on each plot represent error associated with counting statistics only and do not include errors associated with the inverse efficiency function, dead time correction, casing corrections, or water corrections. Historical gross gamma logs collected in 1959 and 1976 are included from Fecht et al. (1977). A repeat log section is also included.

Results and Interpretations:

^{137}Cs was the only man-made radionuclide detected in this borehole. ^{137}Cs was detected at a few sporadic locations throughout the borehole near its MDL of approximately 0.2 pCi/g.

Historical gross gamma logs showed no elevated gamma activity in this borehole in 1959 or 1976, consistent with the current SGLS log data.

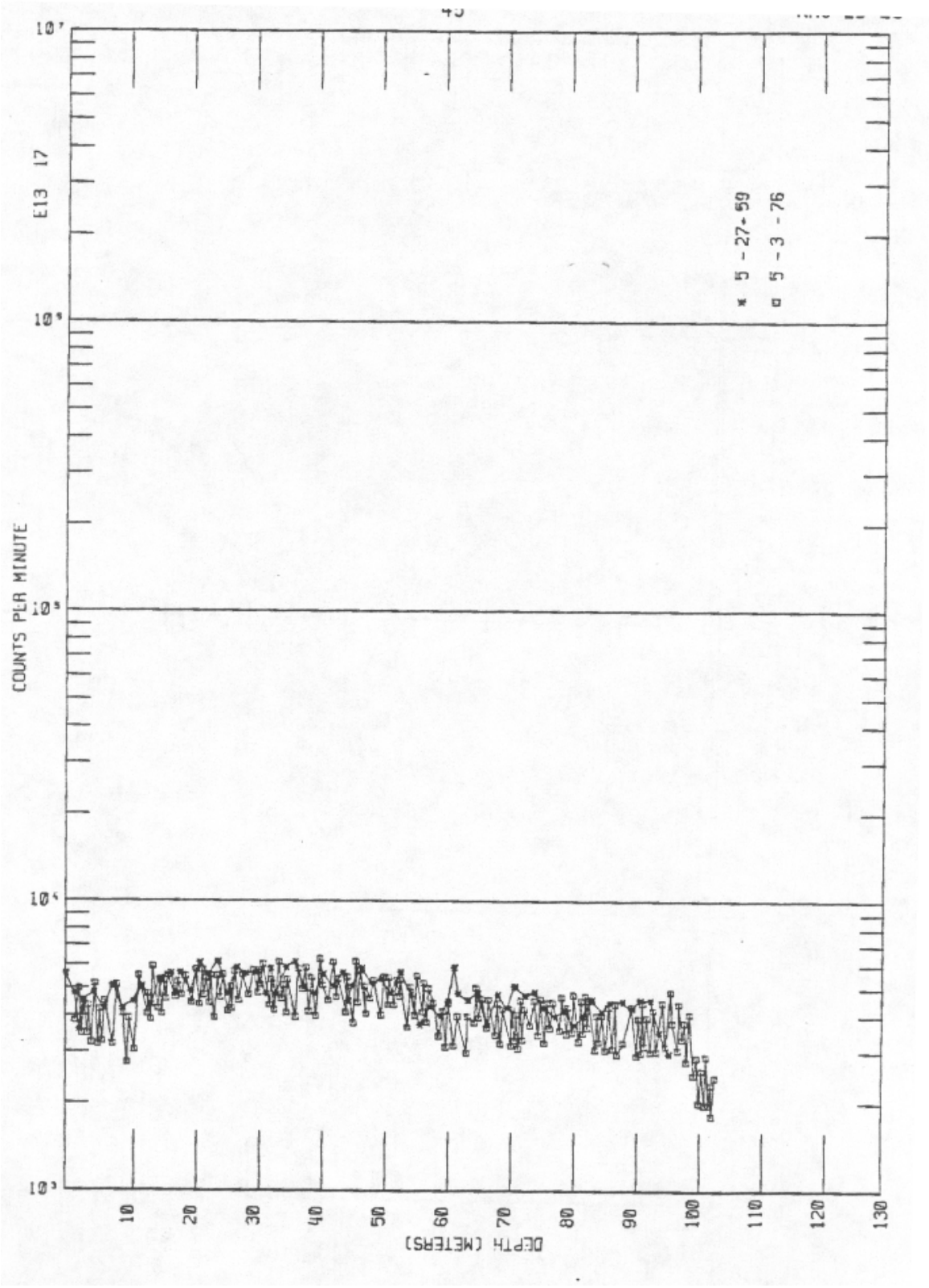
The repeat section indicates good agreement of the naturally occurring KUT.

References:

Fecht, K.R., G.V. Last, and K.R. Price, 1977. *Evaluation of Scintillation Probe Profiles from 200 Area Crib Monitoring Wells*, ARH-ST-156, Atlantic Richfield Hanford Company, Richland, Washington.

Ledgerwood, R.K., 1993. *Summaries of Well Construction Data and Field Observations for Existing 200-East Resource Protection Wells*, WHC-SD-ER-TI-007, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

[1] GWL – groundwater level
[2] N/A – not applicable

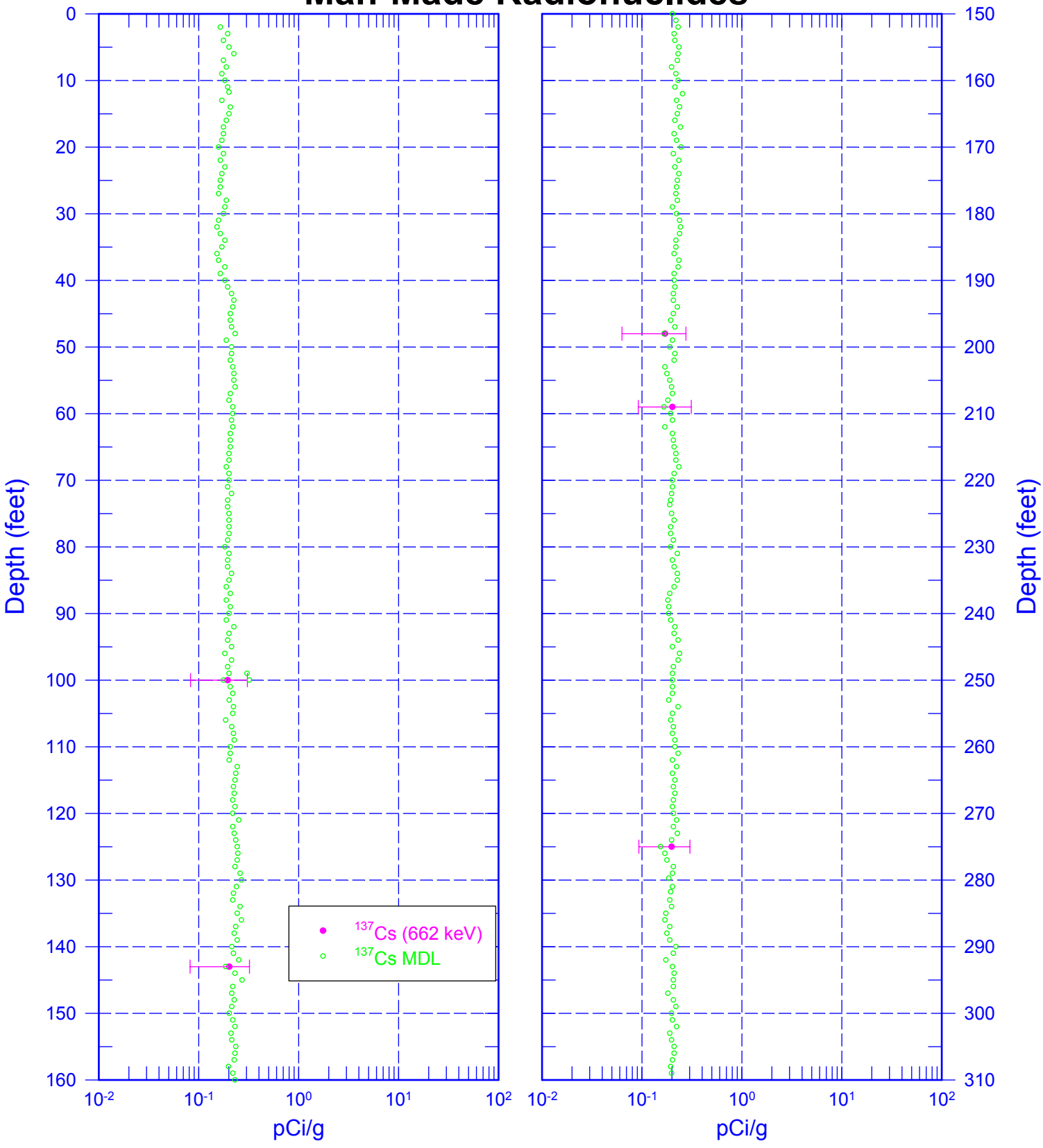


from Fecht et al. (1977)

Scintillation Probe Profiles for Borehole 299-E13-17, Logged on 5/27/59 and 5/3/76

299-E13-17 (A5862)

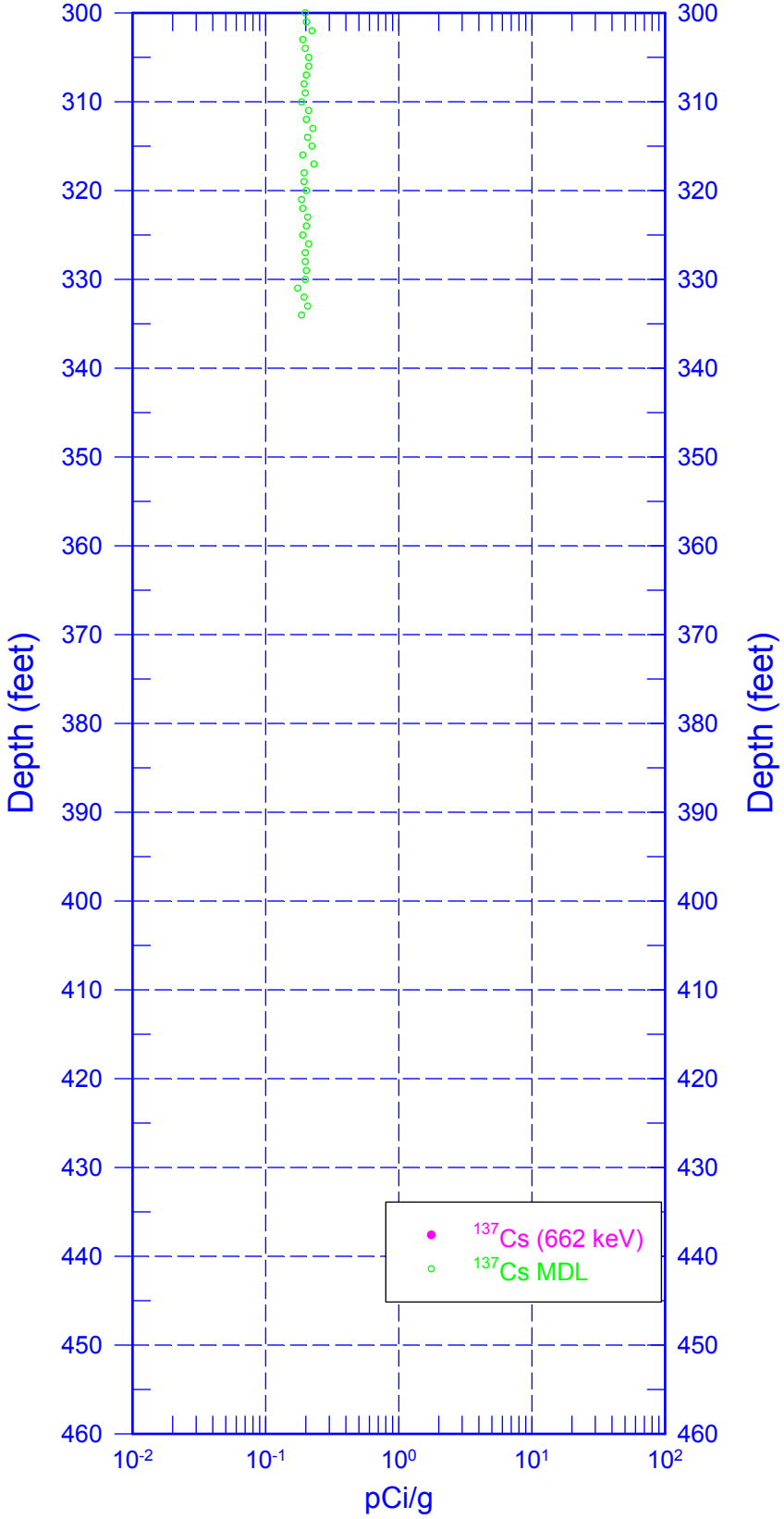
Man-Made Radionuclides



Zero Reference - Top of Casing

Last Log Date - 06/26/03

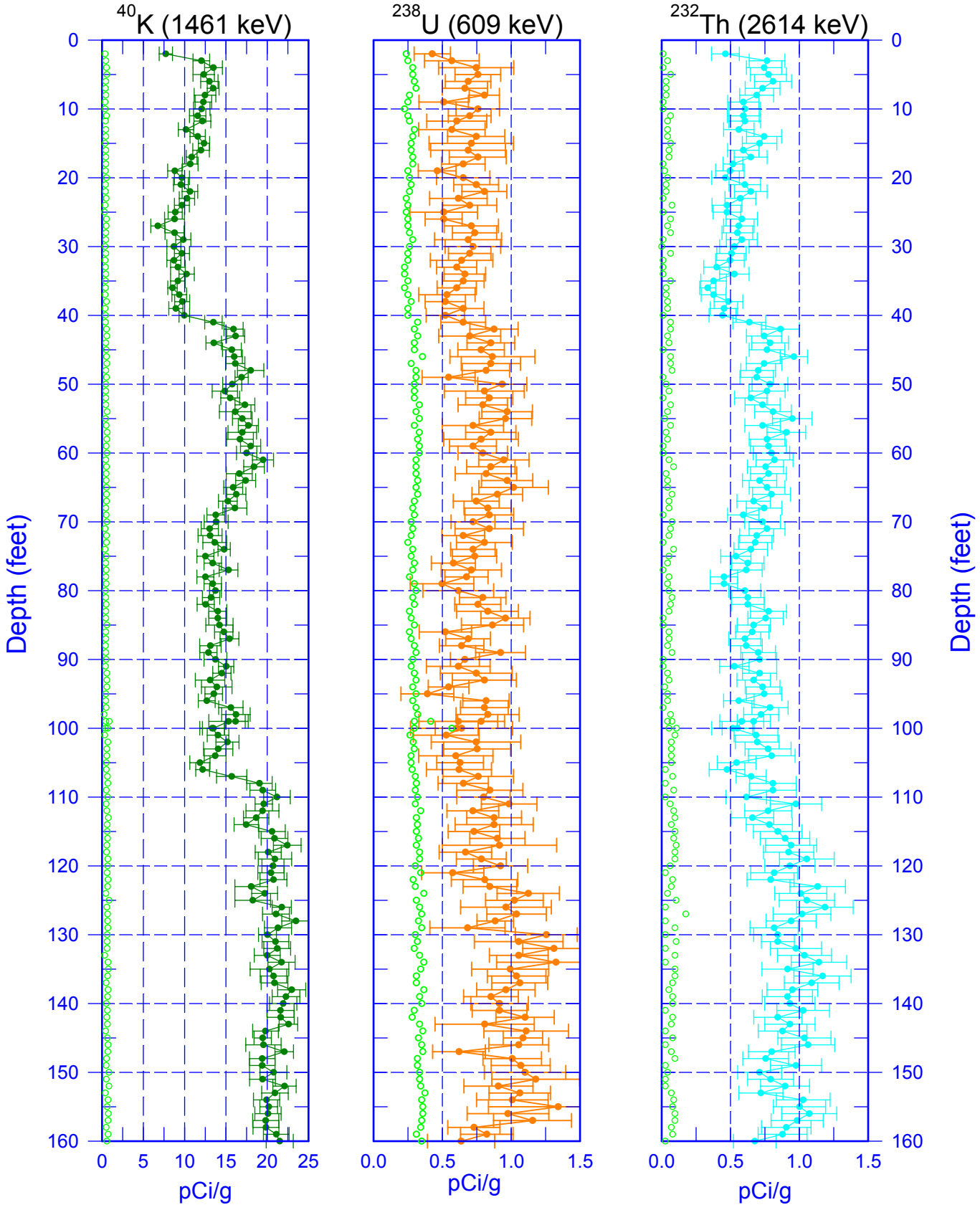
299-E13-17 (A5862)
Man-Made Radionuclides



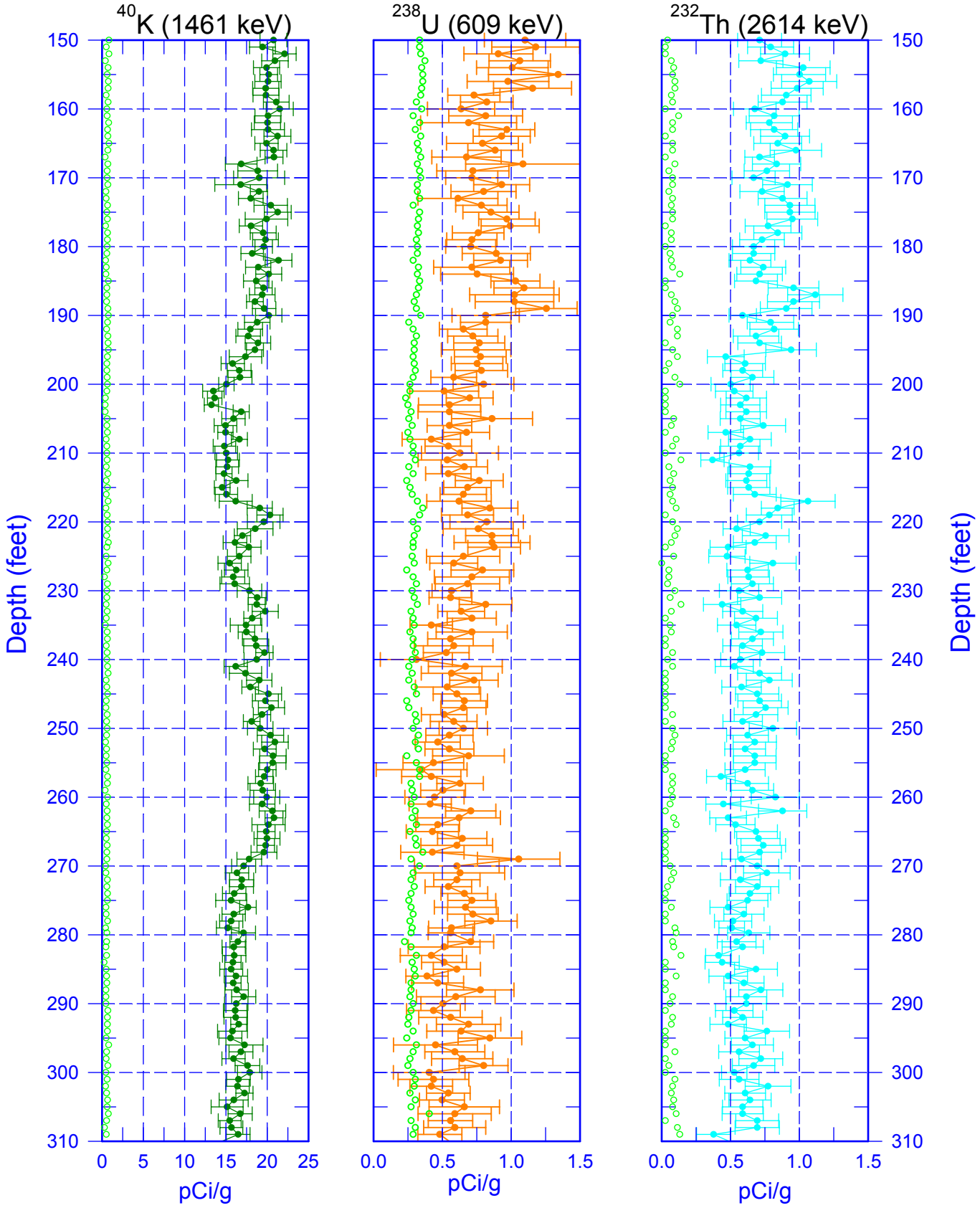
Zero Reference - Top of Casing

Last Log Date - 06/26/03

299-E13-17 (A5862)
Natural Gamma Logs



299-E13-17 (A5862)
Natural Gamma Logs

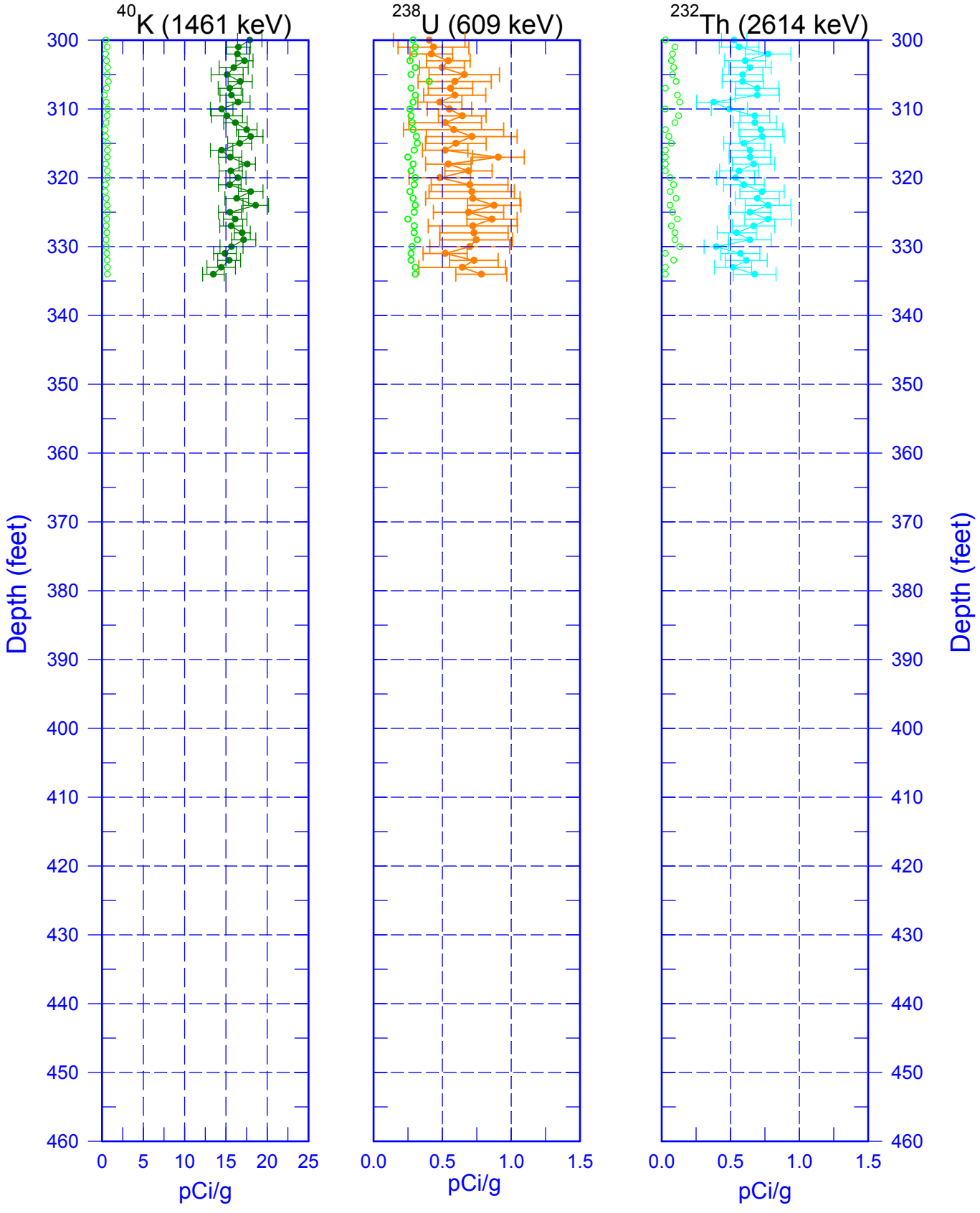


Zero Reference - Top of Casing

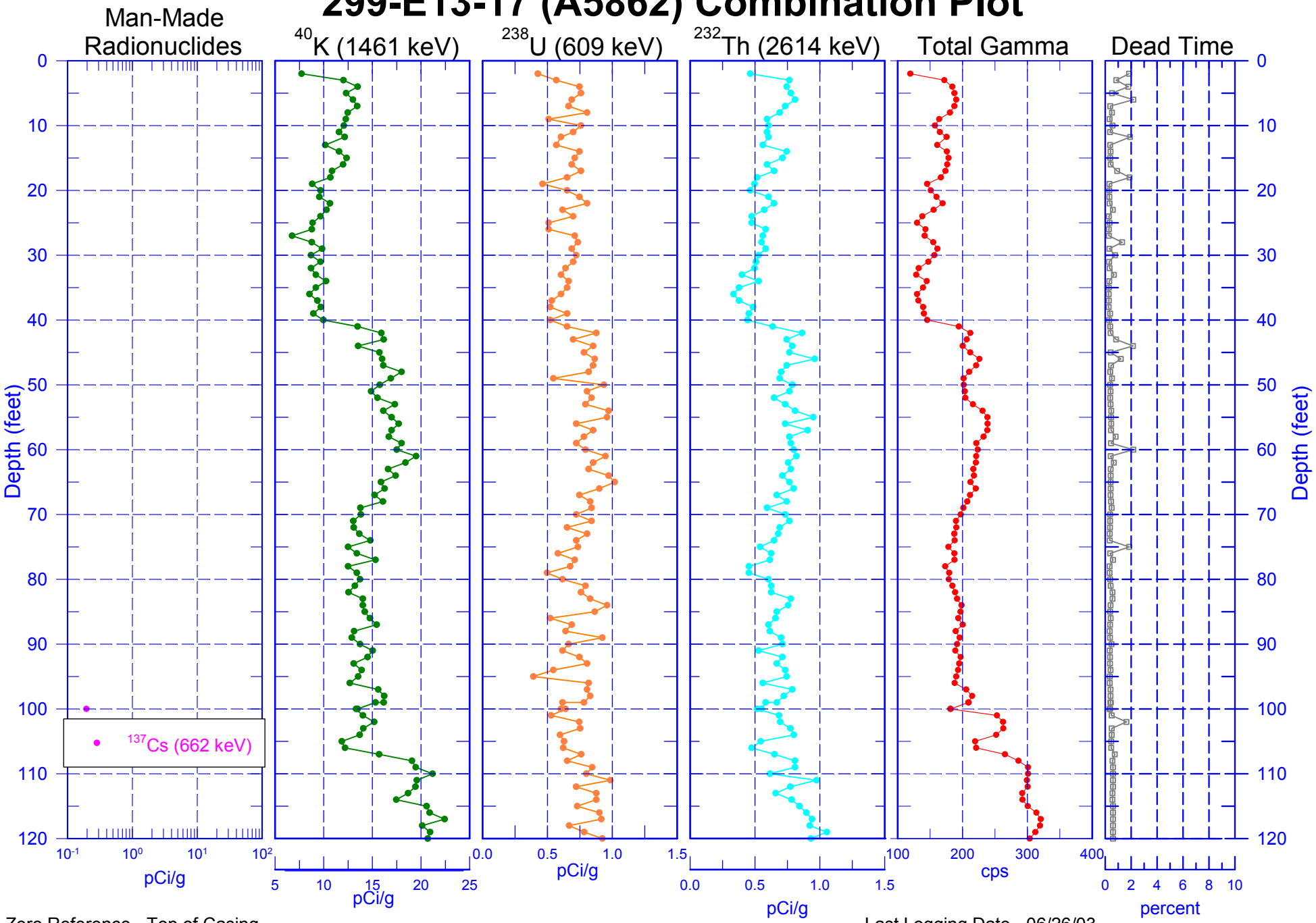
MDL

Last Log Date - 06/26/03

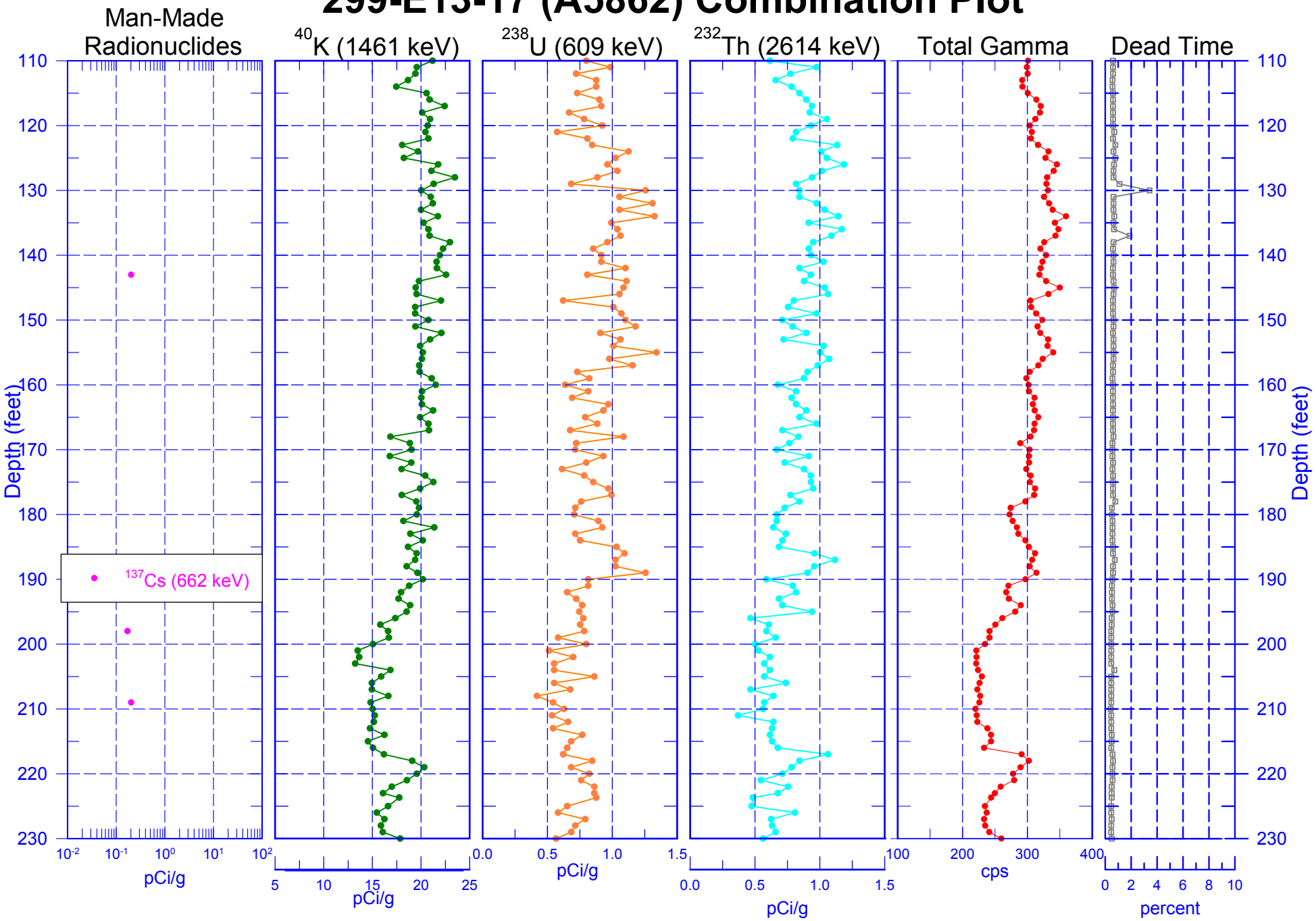
299-E13-17 (A5862)
Natural Gamma Logs



299-E13-17 (A5862) Combination Plot



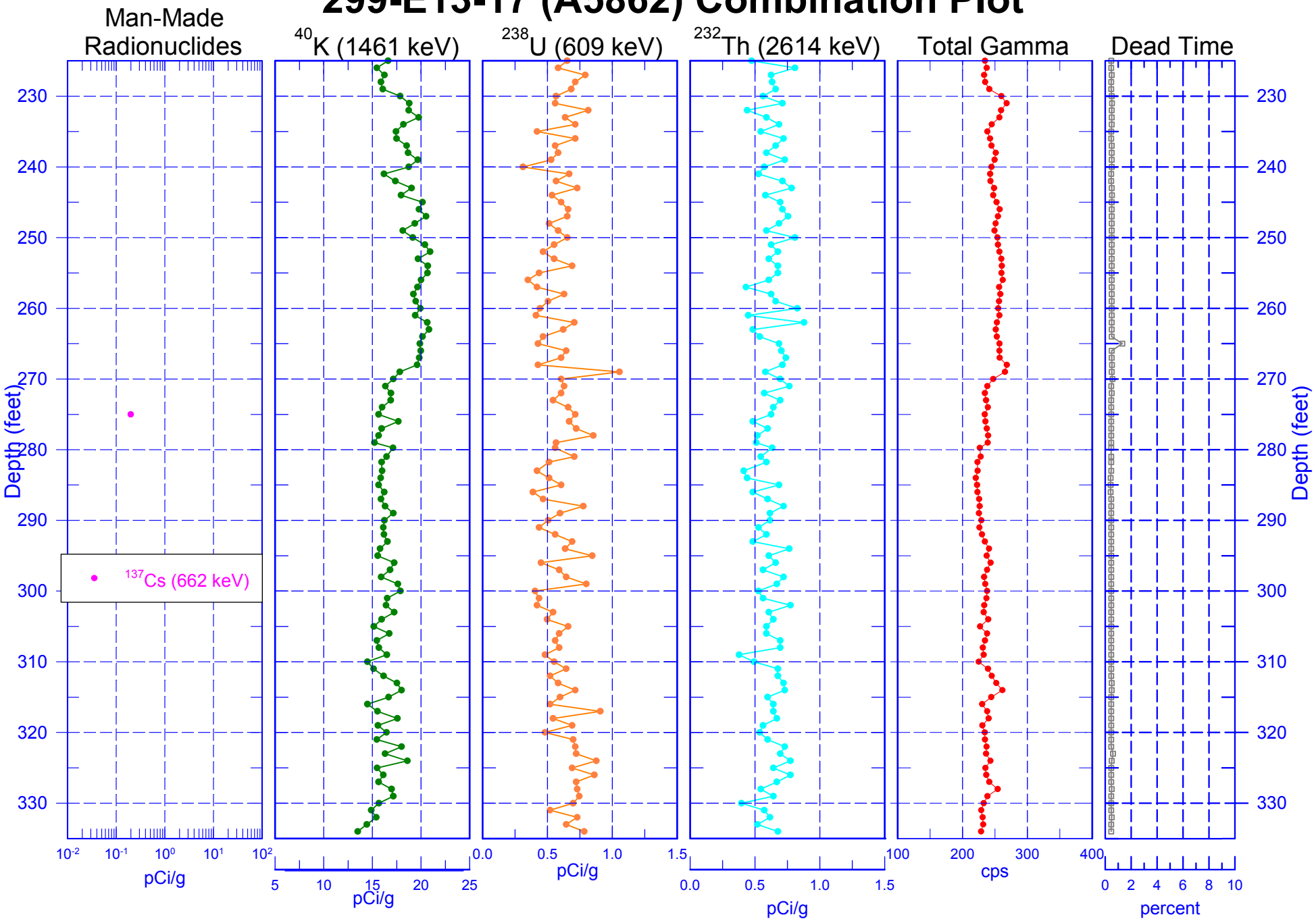
299-E13-17 (A5862) Combination Plot



Zero Reference - Top of Casing

Last Logging Date - 06/26/03

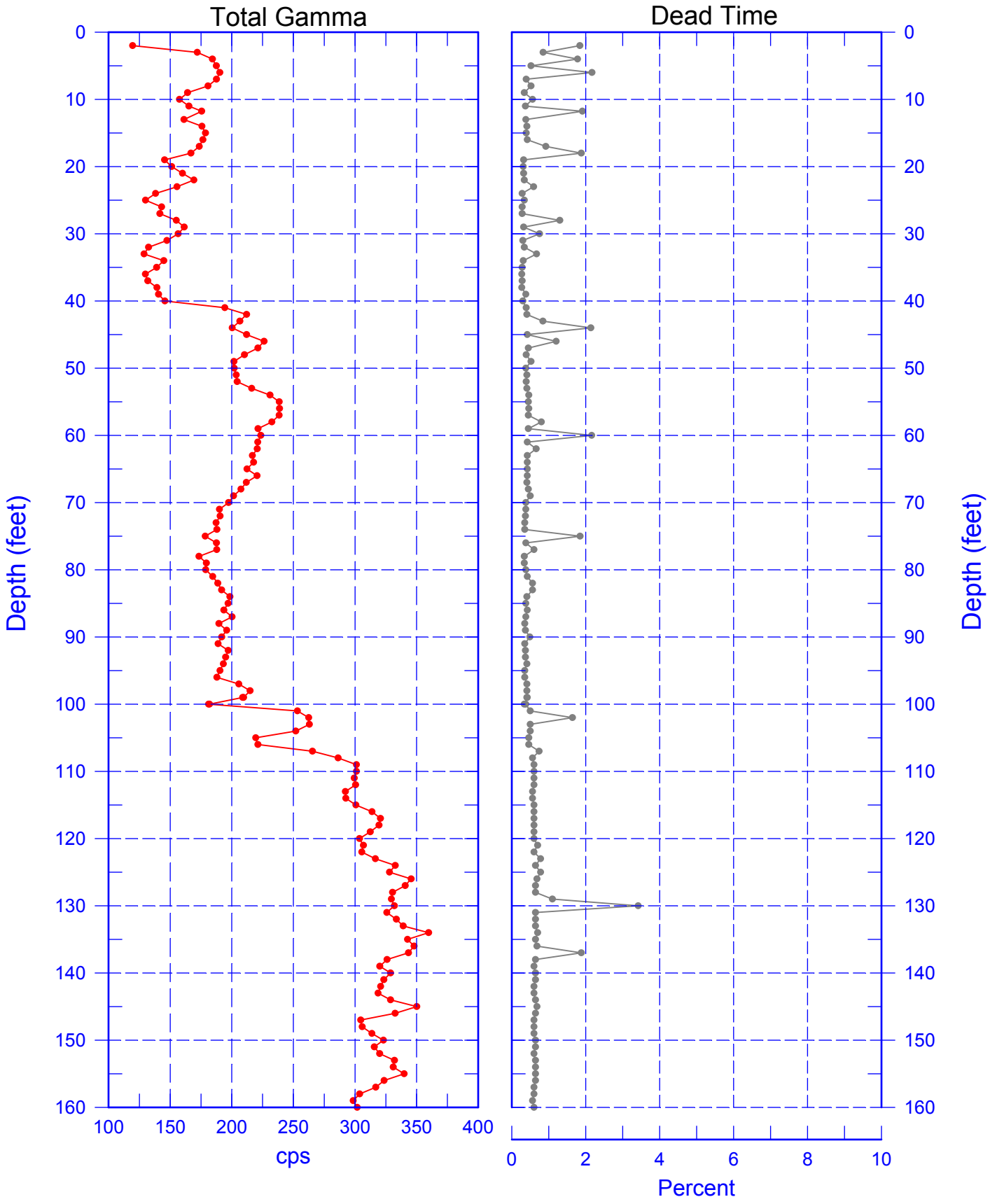
299-E13-17 (A5862) Combination Plot



Zero Reference - Top of Casing

Last Logging Date - 06/26/03

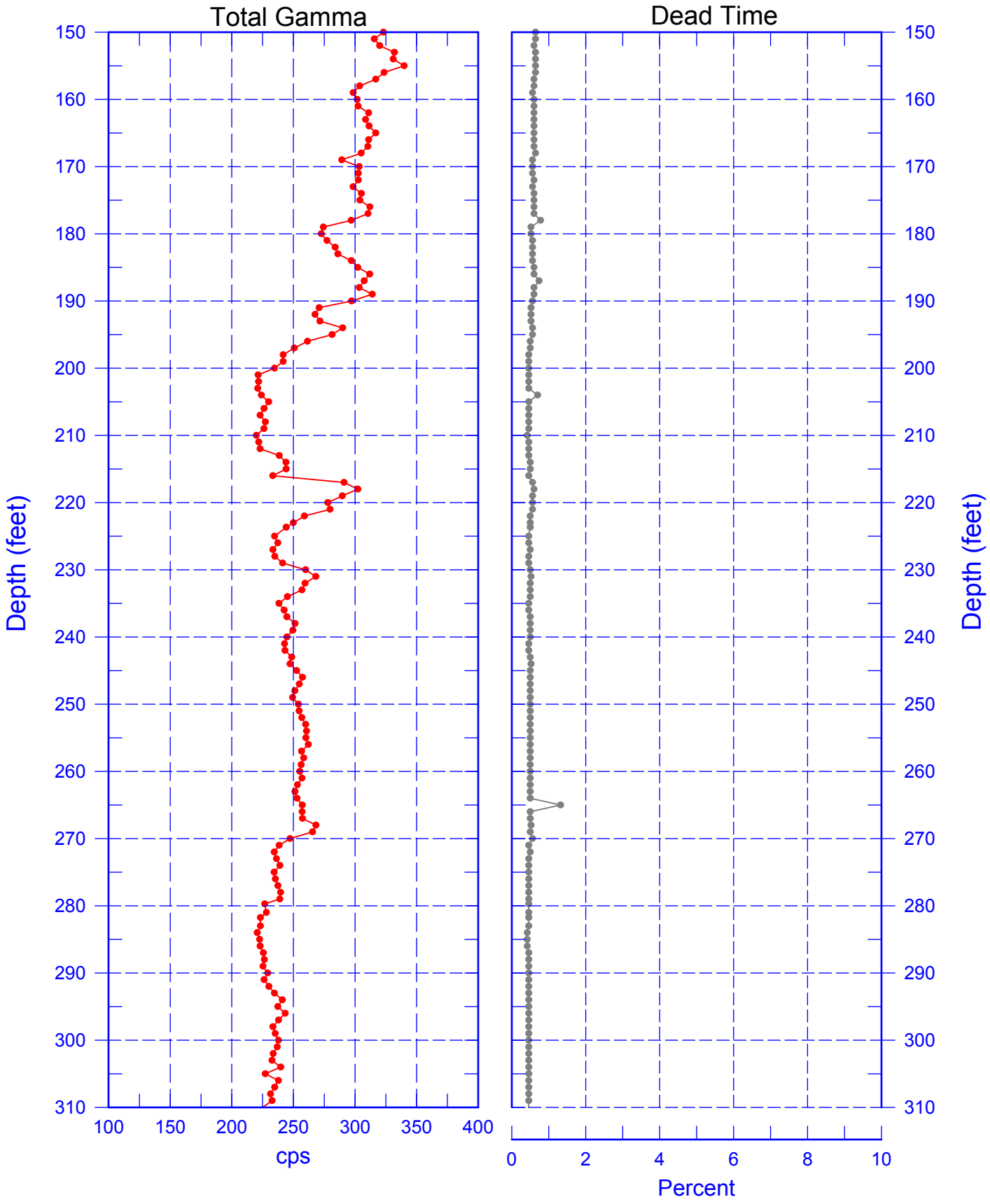
299-E13-17 (A5862)
Total Gamma & Dead Time



Reference - Top of Casing

Last Log Date - 06/26/03

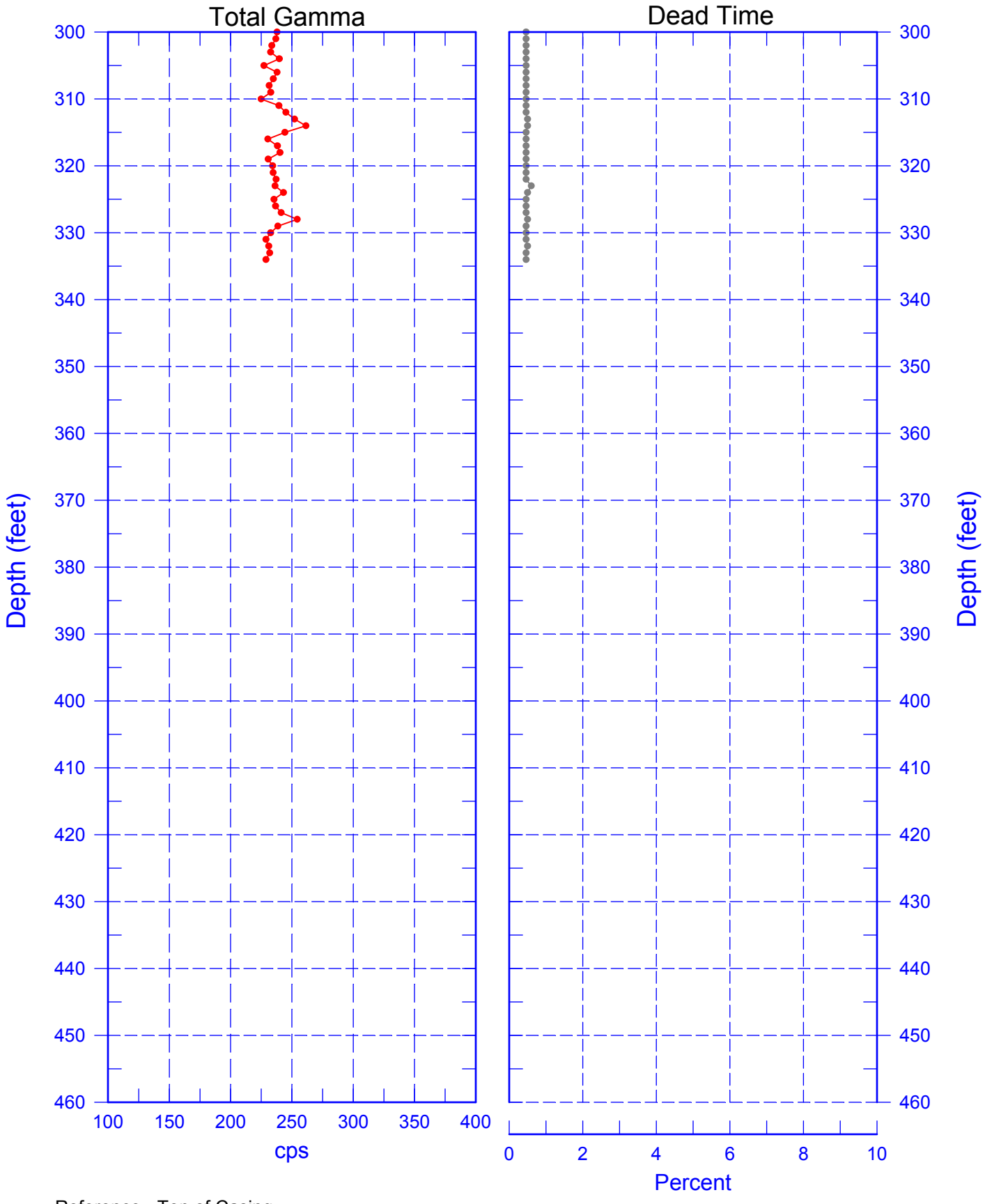
299-E13-17 (A5862)
Total Gamma & Dead Time



Reference - Top of Casing

Last Log Date - 06/26/03

299-E13-17 (A5862)
Total Gamma & Dead Time



Reference - Top of Casing

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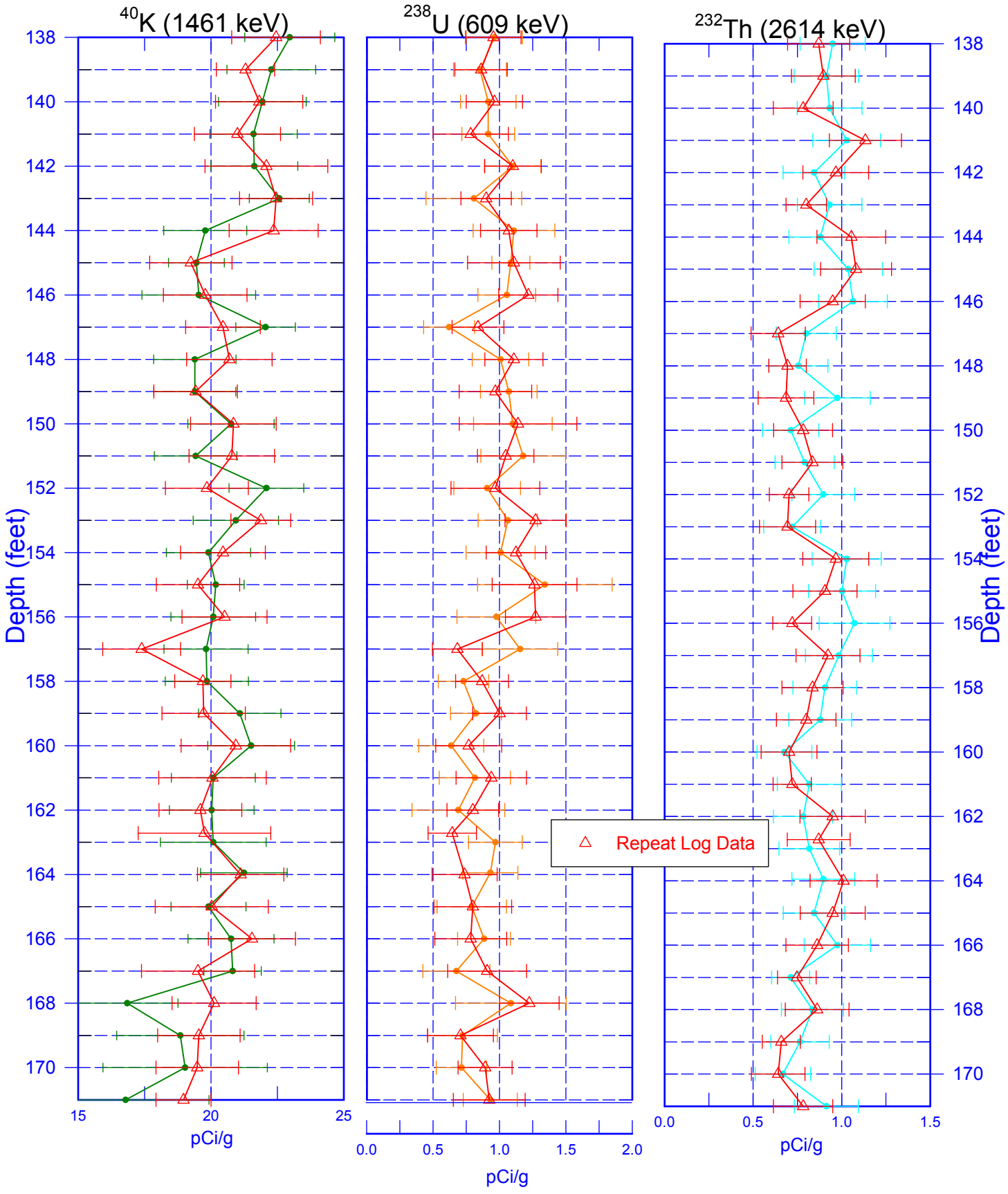
299-E13-17 (A5862)

Repeat Section of Natural Gamma Logs



Zero Reference - Top of Casing

Last Log Date - 06/26/03